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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/723,356	11/27/2000	Leandra Vicci	421/31	5931

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EXAMINER	
YANG, CLARA I	

ART UNIT	PAPER NUMBER
2635	11

DATE MAILED: 08/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/723,356	VICCI ET AL.	
	Examiner	Art Unit	
	Clara Yang	2635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-16,21-27 and 29-38* is/are rejected.

7)☒ Claim(s) *3,17-20 and 28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 November 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *04-08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed on 1 July 2002 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language, specifically DE 37 04 180 and NL 9202158. It has been placed in the application file, but the information referred to therein has not been considered.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "2*n* reactive compensation elements for controlling generation of the local magnetic field, one element being associated with each of the 2*n* sections" (see claim 14) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled

"Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: There is a sentence fragment ("series reactance series reactance") on page 13, line 13.

Appropriate correction is required.

Allowable Subject Matter

4. Claims 3, 17 – 20, and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Objections

5. Claim 30 is objected to because of the following informalities: Change "magnitude current loops" to "magnetic current loops". Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claim 23 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The

applicants teach a model of a magnetic current loop, which is a conductor/transmission line (see page 8 of the specification, lines 4 - 5), wherein the current loop is divided into *n* sections. Each section includes a series inductance L_s, a series resistance R_s, a parallel capacitance C_p, and a parallel resistance R_p (see page 8, lines 20 - 25). The applicants disclose that the parallel capacitance C_p represents the shunt capacitance of each section and that series resistance R_s represents the shunt resistance of each section (see page 8, lines 24 - 25 and page 9, line 1). However, these elements (i.e., a series inductance L_s, a series resistance R_s, a parallel capacitance C_p, and a parallel resistance R_p) are used as means for modeling the current loop; in other words, the applicants omit teaching an actual current loop formed by such elements. And though the applicants teach dividing a current loop into *n* sections and inserting reactive compensation elements into each section, the applicants fail to specify how to determine a first time constant of each shunt capacitance and shunt resistance in order to ensure that each reactive compensation element's reactance value causes each section's series resistance and effective capacitive series reactance to have a second time constant that is equal to the first time constant.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The second limitation calls for 2*n* reactive compensation elements, wherein a current loop is divided into *n* sections, such that each element is "associated with each of the 2*n* sections." Because there are twice as many elements as sections, it is unclear how each element

is supposed to be associated with two sections of the loop. Consequently, the examiner interprets the limitation to mean "2*n* reactive compensation elements..., two elements being associated with each of the *n* sections..."

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 21, 22, 24 - 27, and 29 - 32 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 2,166,750 (Carter).

Referring to claims 21 and 22, Carter teaches an electromagnetic loop system, as shown in Figs. 1 - 3, wherein each current loop is divided into *n* sections and has *n* capacitors coupled to each of the *n* sections. The capacitors partially tune the self-inductance of each loop and enable the current in different sections of the loop to be in phase and of nearly equal amplitude (see Col. 1, lines 50 - 55 and Col. 2, lines 1 - 8); hence each capacitor has a reactance that substantially cancels the inductive reactance of the corresponding section.

Referring to claim 24, as shown in Figs. 1 - 3, Carter's antenna system comprises: (a) *n* current loops for generating a local electromagnetic field, wherein each of the *n* current loops are divided into sections, each section having an inductive reactance; and (b) capacitors coupled to each section for controlling generation of the electromagnetic field. Carter teaches using the capacitors to provide uniform current distribution (see Col. 1, lines 40 - 43). As explained in

claim 21, each capacitor has a reactance that substantially cancels the inductive reactance of the respective section.

Regarding claim 25, as shown in Fig. 1, *n* is equal to one.

Regarding claim 26, as shown in Figs. 2 and 3, *n* is greater than one.

Regarding claim 27, as shown in Figs. 2 and 3, Carter teaches at least three current loops being coaxial with each other. Here it is understood that the current loop in the middle is the third loop.

Regarding claims 29 - 31, as shown in Fig. 2, the current flows counter-clockwise through the current loop having 0.29 wavelengths, and the current flows clockwise through the current loop having 0.85 wavelengths. Carter discloses that several of the concentric arrays shown in Fig. 2 can be place one above the other as shown in Fig. 3 (see Col. 2, lines 25 – 28). Here it is understood that the stacked concentric arrays are identical. Consequently, Carter teaches the following at least an upper array of two concentric current loops and a lower array of two concentric current loops, wherein the upper array is a first pair of inner and outer current loops and the lower array is a second pair of inner and outer current loops. In order for the invention to give considerable increase in latitudinal concentration of radiation (see Col. 2, lines 14 – 18), the current must flow in one direction through the inner current loops of the upper and lower arrays, and the current must flow in the opposite direction through the outer current loops of the upper and lower arrays.

Regarding claim 32, Carter teaches that the current flows in the same direction in all the loops in Fig. 3 (see Col. 21 – 25).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 1, 2, 4 - 16, and 33 - 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,914,692 (Bowers et al.) in view of U.S. Patent No. 2,166,750 (Carter).

Referring to claims 1, 2, 4, 7, 11 - 13, 33 - 35, and 38 Bowers teaches an electronic article surveillance (EAS) system having a multiple loop antenna for generating radio frequency (RF) magnetic fields (see Abstract and Col. 2, lines 52 - 67). As shown in Fig. 2, Bowers discloses an antenna 30 comprising: (a) upper current loop 36 and lower current loop 38, wherein each current loop is divided into 3 sections (sides 40, 42, and 44 for current loop 36 and sides 54, 56, and 58 for current loop 38) (see Col. 6, lines 4 - 9 and 27 - 33); and (b) transmitter 64 or current source coupled to upper current loop 36 and lower current loop 38 such that current flows clockwise in upper current loop 36 and counter-clockwise in lower current loop 38, thereby

substantially canceling a dipole field at a distance spaced from the upper and lower current loops (see Col. 6, lines 66 - 67 and Col. 7, lines 1 - 9). Because each side 40, 42, 44, 54, 56, and 58 is connected in series and antenna 30 is operative at a selected frequency (see Col. 7, lines 10 - 28), each side or section of the upper and lower current loops must have a series reactance at the selected frequency. Bowers, however, is silent on (1) adding a capacitor to each side/section of the upper and lower current loops such (as required in claims 1, 2, and 34), such that each section is substantially equal in length (as required in claims 4 and 35) and that the capacitors make the current's amplitude and phase uniform throughout the loop (as required in claim 38); (2) arranging upper current loop 36 in a first plane and lower current loop 38 in a second plane spaced from and parallel to the first plane (as required in claim 7); (3) arranging the upper and lower current loops such that they are coaxial with each other and that the sides of upper current loop 36 are substantially equal in length to adjacent sections of lower current loop 38 (as required in claims 11 and 12); and (4) providing reactive compensation elements in upper current loop 36 that are substantially equal in reactance to the reactive compensation elements of lower current loop 38 (as required in claim 13).

In an analogous art, Carter teaches an antenna that provides substantially equal radiation in the horizontal plane with considerable latitudinal concentration (see Col. 1, lines 17 - 20). In Figs. 1 - 3, Carter uses condensers/capacitors spaced at proper intervals in each loop to provide uniform current distribution (see Col. 1, lines 40 - 43). Per Carter, each capacitor partially tunes the self-inductance of the loop and enables the current in different parts of the loop to be in phase and of nearly equal amplitude (see Col. 1, lines 50 - 55 and Col. 2, lines 1 - 8). In other words, each capacitor reactively compensates the inductive reactance of each section of the loop. Carter discloses that the lengths of the wire sections should not exceed one-

quarter wavelength in order to obtain substantially equal current at all points (see Col. 2, lines 5 - 8); thus it is understood that each section is equal in length, as further evidenced by Figs. 1 - 3), and that each section has substantially equal inductive reactance. In Figs. 2 and 3, Carter suggests arranging the current loops such that they are spaced apart, parallel to each other, and coaxial (see Col. 2, lines 21 - 28). As shown in Fig. 3, all sections of the top current loop are substantially equal in length to adjacent sections in the middle current loop. From Fig. 3, it is understood that the loops are identical and that the capacitors of each loop are substantially equal in reactance to the adjacent capacitors in the other loops.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify antenna 30 of Bowers as taught by Carter because an antenna 30 having current loops that are spaced apart, parallel to each other, and coaxial, wherein each current loop is divided into sections by capacitors, provides equal radiation in the plane of the loops (see Carter, Col. 1, lines 17 - 20 and Col. 3, lines 34 - 38), thereby improving the surveillance zone of the EAS system.

Regarding claims 5 and 36, in the embodiment shown in Fig. 5, Bowers discloses that sides 146 and 156 are 15 inches long, that sides 148 and 158 are 31.6 inches long, and that sides 150 and 160 are 34.98 inches long (see Col. 12, lines 19 - 23). Because each side/section is unequal, the inductive reactance of each side/section is also unequal.

Regarding claims 6 and 37, Bowers discloses that antenna 30 is preferred to operate at 8.2 MHz because 8.2 MHz is a commonly employed frequency in EAS systems (see Col. 7, lines 20 - 26). Because Bowers adds that other frequencies can be used, it is understood that transmitter 64 can operate at 13.56 MHz, which is another frequency commonly employed in EAS systems as acknowledged by the applicants on page 3 of the specification.

Regarding claims 8 and 10, each current loop of Bowers has more than one turn, as shown in Figs. 2 - 8.

Regarding claim 9, Bowers omits teaching that each current loop has only one turn.

Carter, on the other hand, teaches an antenna having at least one circular current loop (see Figs. 1 - 3), which is understood to have only one turn.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify antenna 30 of Bowers as taught by Carter because an antenna 30 having circular current loops that are spaced apart, parallel to each other, and coaxial, wherein each current loop is divided into sections by capacitors, provides equal radiation in the plane of the loops (see Carter, Col. 1, lines 17 - 20 and Col. 3, lines 34 - 38), thereby improving the surveillance zone of the EAS system.

Referring to claims 14 - 16, as explained above in claims 1, 33, and 38, Bowers teaches an EAS reader comprising: (a) upper current loop 36 and lower current loop 38, wherein each current loop is divided into 3 sections (sides 40, 42, and 44 for current loop 36 and sides 54, 56, and 58 for current loop 38) (see Col. 6, lines 4 - 9 and 27 - 33); and (b) transmitter 64 or current source coupled to upper current loop 36 and lower current loop 38 such that current flows clockwise in upper current loop 36 and counter-clockwise in lower current loop 38, thereby substantially canceling a dipole field at a distance spaced from the upper and lower current loops (see Col. 6, lines 66 - 67 and Col. 7, lines 1 - 9). As previously explained, each side or section of the upper and lower current loops must have a series reactance at the selected frequency. Bowers omits teaching (1) dividing antenna 30 into n sections and $2n$ capacitors, wherein two capacitors are associated with each n section (as required in claim 14) and (2) arranging both current loops such that they are coaxial with each other (as required in claim 15).

In an analogous art, as explained above in claims 1, 33, and 38, in Figs. 1 and 3, Carter uses condensers/capacitors spaced at proper intervals in each loop to provide uniform current distribution (see Col. 1, lines 40 - 43). Here it is understood that each current loop is divided in half (i.e., n = 2), wherein each section comprises two capacitors. Per Carter, each capacitor partially tunes the self-inductance of the loop and enables the current in different parts of the loop to be in phase and of nearly equal amplitude (see Col. 1, lines 50 - 55 and Col. 2, lines 1 - 8). In other words, each capacitor reactively compensates the inductive reactance of each n /2 section of the loop. Carter discloses that the lengths of the wire sections should not exceed one-quarter wavelength in order to obtain substantially equal current at all points (see Col. 2, lines 5 - 8); thus it is understood that each section is equal in length, as further evidenced by Figs. 1 - 3), and that each section has substantially equal inductive reactance. In Fig. 3, Carter suggests arranging the current loops such that they are spaced apart, parallel to each other, and coaxial (see Col. 2, lines 21 - 28).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify antenna 30 of Bowers as taught by Carter because an antenna 30 having current loops that are spaced apart, parallel to each other, and coaxial, wherein each current loop is divided into sections by capacitors, provides equal radiation in the plane of the loops (see Carter, Col. 1, lines 17 - 20 and Col. 3, lines 34 - 38), thereby improving the surveillance zone of the EAS system.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- U.S. Patent No. 5,061,941 (Lizzi et al.): Lizzi teaches an EAS system comprising an antenna having multiple current loops.

- U.S. Patent No. 5,459,451 (Crossfield et al.): Crossfield teaches an EAS system comprising an interrogator, wherein the interrogator's antenna is formed by multiple current loops such that a strong near field is produced while reducing the far field.

- U.S. Patent No. 6,166,706 (Gallagher, III et al.): Gallagher teaches an EAS system operating at 13.56 MHz, wherein the interrogator comprises three current loops.

- U.S. Patent No. 6,172,608 (Cole): Cole teaches an EAS system comprising an EAS system operating at 13.56 MHz and having an interrogator, a label/transponder, and a parasitic antenna for improving the surveillance zone of the interrogator, such that the parasitic antenna is formed by a current loop having a plurality of capacitors to reduce the parasitic antenna's self-inductance.

⌘

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Clara Yang whose telephone number is (703) 305-4086. The examiner can normally be reached on 8:30 AM - 7:00 PM, Monday - Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Horabik can be reached on (703) 305-4704. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CY
16 August 2004

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